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THE VEGETATION ON LOOKINGGLASS MOUNTAIN *

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I. LOCATION AND GEOLOGY

Lookingglass Mountain or rock is located in the northern part of Transylvania County, North Carolina, on the estate of George W. Vanderbilt; the extreme northern corner of the county being occupied by that curious valley, the "Pink Beds." Lookingglass Mountain is about three miles southeast of Pisgah Ridge which forms the northwestern boundary of the county with altitudes of 4,500 feet (Pigeon Gap) to 6,040 feet (Chestnut Bald), and situated between two streams, Rockhouse Creek and Lookingglass Creek, both emptying into Davidson River below the mountain, at an altitude of about 2,300 feet. The summit of Lookingglass is 4,000 feet altitude and three sides of the mountain are granite cliffs, in places several hundred feet high, the top being a table-like summit sloping southwestward toward Davidson River, on which side the cliffs are few or in places none. The greatest abruptness of slope is on the northern and eastern sides. Viewed from the northeast (Fig. 1) the mountain appears like a gigantic dome rising in the middle of a valley, all the mountains surrounding it possessing equal or greater altitudes except the narrow valley of Davidson River.

The geological structure is Whiteside granite, the peculiar shape said to be due to spheroidal weathering of the granite which is supposed to be of an intrusive origin and younger than the surrounding formations, perhaps as late as the Carboniferous Age.

The soil on the summit is nowhere deep and in many places

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entirely absent. Chiefly it is a yellowish clay strewn with fine sand and, where vegetation is persistent, the admixture of humus produces a fairly fertile soil which is however, from the nature of its composition, origin, and position, subjected to extremes of moisture and dryness. Numerous tiny springs rise here and there and, escaping down the smooth surfaces of the granite, furnish periodical moisture for extensive lithophytic societies, chiefly lichens. Most of the springs cease with periods of drought.



FIGURE 1. Lookingglass Mountain from the northeast.

2. VEGETATION

The northern and western exposures of granite are in particular, covered with a more or less dense growth of lichens. In crevices and more secure places, mosses and *Scelaginella* occur; the latter, however, is much more abundant on the exposed rocks of Roan and Carolina gneiss, which make up the adjacent Pisgah Ridge.

The arborescent flora possesses many features of peculiar interest. Deformities due to exposure to severe winds are abundant.

The coniferous species are most conspicuous from a distance but do not comprise the largest number of individuals. There are four species. *Tsuga caroliniana* is abundant all over the northern and western brow of the mountain (Fig. 2). *Pinus pungens* is as conspicuous and more generally distributed down the backbone of the mountain (Fig. 3), as well as occurring as twisted and deformed individuals in crevices and on ledges on the upper slopes of the cliffs. *Juniperus virginiana* is scattered along exposed places and is always dwarfed or grotesque in shape.



FIGURE 2. Hemlocks on the northern and western brow.

Pinus rigida is found chiefly along and down the backbone of the mountain, the forest of which partakes more of the character of that of the adjacent dry ridges. Of these four conifers, the last only is common throughout the adjacent region, *Juniperus* being very rare and *Tsuga caroliniana* being represented by but one mature individual in the Pink Beds, and none so far as known on Pisgah Ridge. *Pinus pungens* occurs in scattered colonies along the exposed slopes of Pisgah Ridge, and rarely in the Pink Beds valley, which is underlaid by Whiteside granite, sometimes exposed.

The broadleaf arborescent species do not show the same degree of localization as shown by the coniferous species. The most important species are *Castanea dentata*, *Quercus Prinus*, *Q. coccinea*, *Q. rubra*, *Q. alba*, *Acer rubrum*, *Hicoria glabra*, and *Cornus florida*. Dwarfed or shrub-like specimens of several smaller trees are common, especially on the exposed brow of the cliff, the principal species being *Amelanchier canadensis*, *Castanea pumila*, *Chionanthus virginica*, *Symplocos tinctoria*, *Hamamelis*



FIGURE 3. Pines on Lookingglass Mountain.

virginiana, and *Sassafras variifolium*. Perhaps the most interesting broadleaf found here was *Populus grandidentata*, represented by a few young trees.

Among the shrubs, *Kalmia latifolia* and *Rhododendron maximum* predominate here as they do nearly everywhere in this region. A very rare species here is *Rhododendron punctatum* which is common along the Davidson River banks, 2,000 feet lower, and on Cold Mountain, 2,000 feet higher. On the southern exposures of the mountain, *Kalmia* blooms a week earlier than it does

on the adjacent ridges and two to three weeks earlier than in the Pink Beds, nearly 1,000 feet lower altitude. The buckberry (a local name), *Gaylussacia ursina*, *G. resinosa*, *Clethra acuminata*, *Leucothoë recurva*, *Azalea lutea*, *Pyrus melanocarpa* (*Aronia nigra* Britton), *Vaccinium corymbosum*, *Robinia hispida*, and *Rhus copallina* are common and conspicuous shrubs on the summit of the exposed cliffs. The drier woods on the back of the mountain contain numerous specimens of *Myrica asplenifolia* and *Vaccinium stamineum*. *Epigaea repens* is common on the wooded portions of the summit.

The herbaceous vegetation varies greatly in appearance with the season. In early May the most conspicuous herbaceous plants are *Viola hastata*, *V. rotundifolia*, *Adopogon montanus*, *Hypoxis hirsuta*, *Potentilla canadensis*, *Iris verna*, *Erigeron pulchellus*, *Saxifraga virginensis*, *Viola pedata*, *V. primulaefolia*, and *V. affinis*.

In midsummer most of the above named plants become inconspicuous and their place is taken by such species as *Eupatorium pubescens*, *Gerardia tenuifolia*, *Aster Curtissii*, *Bidens bipinnata*, *Steironema heterophyllum*, *Capnoides sempervirens*, *Talinum teretifolium*, and *Xyris* sp.

The last two named are not found elsewhere in the adjacent region, although the writer has not visited John Rock and Cedar Rock Mountains nearby which possess similar geological formations.

WOODY PLANTS OF LOOKINGGLASS MOUNTAIN IN ORDER OF RELATIVE ABUNDANCE

(Starred species were either young, dwarfed, or shrub-like.)

TREES

Quercus Pinus L.
Castanea dentata (Marsh)
Borkh.
Quercus rubra L.
Tsuga caroliniana Engelm.
Quercus coccinea Muench.
Pinus pungens Lamb.
Quercus alba L.

SHRUBS

Kalmia latifolia L.
Rhododendron maximum L.
Vaccinium corymbosum L.
Gaylussacia ursina (M. A. Curtis) T. & G.
Andromeda ligustrina (L.) Muhl.
Vaccinium stamineum L.
Rhododendron punctatum Andr.

<i>Acer rubrum</i> L.	<i>Azalea lutea</i> L.
<i>Cornus florida</i> L.	<i>Pyrus melanocarpa</i> (Michx.)
<i>Sassafras variifolium</i> (Salisb.)	Willd.
Ktze.*	<i>Clethra acuminata</i> Michx.
<i>Chionanthus virginica</i> L.*	<i>Gaylussacia resinosa</i> T. & G.
<i>Castanea pumila</i> (L.) Mill.*	<i>Leucothoë recurva</i> (Buckley) Gray.
<i>Hicoria glabra</i> (Mill.) Britton	<i>Rhus copallina</i> L.
<i>Amelanchier canadensis</i> (L.)	<i>Myrica asplenifolia</i> L.
Medic.	<i>Amorpha fruticosa</i> L.
<i>Halesia carolina</i> L.	<i>Robinia hispida</i> L.
<i>Symplocos tinctoria</i> (L.) L'Her.*	<i>Sambucus canadensis</i> L.
<i>Robinia Pseudo-Acacia</i> L.	
<i>Hamamelis virginica</i> L.*	
<i>Pinus rigida</i> Mill.	
<i>Acer pennsylvanicum</i> L.*	
<i>Oxydendron arboreum</i> (L.) DC.	
<i>Nyssa sylvatica</i> L.	
<i>Liriodendron Tulipifera</i> L.	
<i>Populus grandidentata</i> Michx.	
<i>Betula lutea</i> Michx. f.	
<i>Juniperus virginia</i> L.*	

It is interesting to note that eleven of the seventeen species of shrubs belong to the Ericaceae. Of the arborescent species, six belong to the Fagaceae and four to the Pinaceae. Nearly all of the other arborescent species represent different families.

BILTMORE FOREST SCHOOL

A NEW SPECIES OF *DEWALQUEA* † FROM THE AMERICAN CRETACEOUS ‡

BY EDWARD W. BERRY.

The genus *Dewalquea* was founded by Saporta and Marion in 1874 § upon remains from the Senonian of Westphalia communicated by Debey and named by him in manuscript *Araliophyllum*, and on additional remains collected by those authors from the

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‡ Published by permission of the Director of the United States Geological Survey.

§ Saporta and Marion, Mém. cour. et des Sav. étrangers de l'Académie 37 : 55.